

G-025

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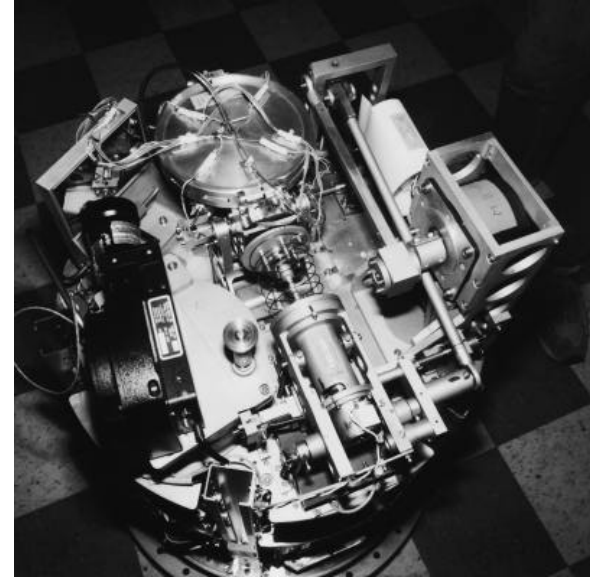
Customer: ERNO-Raumfahrttechnik GMBH;
H. Hoffman & P. Sandermeier

Payload Mgr: Dr. Peter Vits

NASA Tech Mgr: Leroy F. Shiflett

Mission: STS-51-G, June 17, 1985

The development of future spacecraft fuel tanks was advanced in payload G-025, which examined the behavior of liquid in a tank in microgravity. This Liquid Sloshing experiment simulated the behavior of liquid propellants in satellite tanks during in-orbit operations. The experiment subjected a reference fluid in a hemispherical model tank to linear acceleration inputs of known levels and frequencies. The experiment results were expected to validate and refine characteristics of tank-fluid systems and to be especially useful in the design of devices that manage propellants in surface tension tanks. The experiment was designed and built by the European firm, MBB/ERNO, Bremen, West Germany.



This Liquid Sloshing Experiment provided information for managing propellants in surface tension tanks.

G-034

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Customer: Dickshire Coors; Richard N. Azar

Payload Mgr: Suzanne S. Azar

NASA Tech Mgr: Lawrence R. Thomas

Mission: STS-51-G, June 17, 1985

El Paso area high school students designed and built the experiments in this GAS payload—an effort spanning nearly three years for the students and eight for their sponsors and advisors. Their microgravity experiments studied: the growth of lettuce seeds; barley seed germination; the growth of brine shrimp; germination of turnip seeds; the regeneration of the flat worm planeria; the wicking of fuels; the effectiveness of antibiotics on bacteria; the growth of soil mold; crystallization in zero gravity; the symbiotic growth of the unicellular algae chlorella and the milk product kefir; the operation of liquid lasers; and the effectiveness of Dynamic Random Access Memory computer chips without ozone protection.



Mike Izquierdo, technical advisor to the El Paso students, connected their experiments to the flight controller. (Photo by Rudy Gutierrez, The El Paso Times)

G-027

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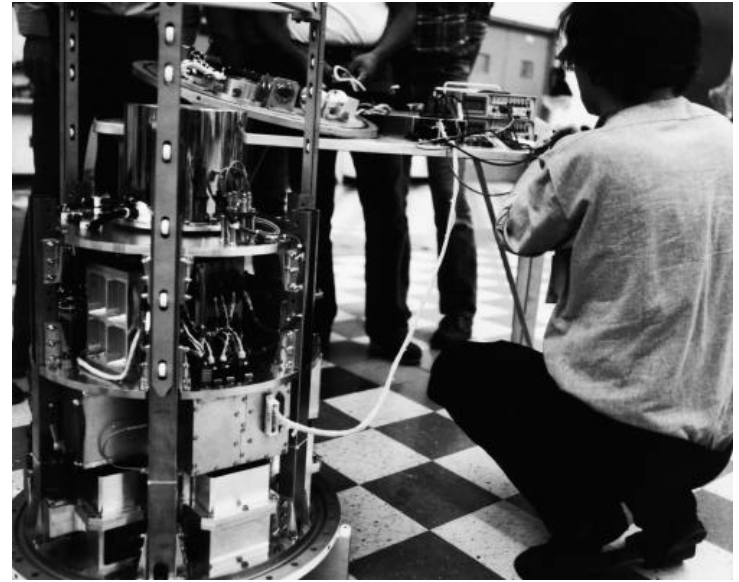
Customer: DFVLR; H. Schreiber
& H. Hebenstrick

Payload Mgr: Dieter Baum

NASA Tech Mgr: Leroy F. Shiflett

Mission: STS-51-G, June 17, 1985

Ceramic technology research involving slipcasting under microgravity was performed in payload G-027 by Germany's materials research project MAUS. On Earth, the process of using ceramic slurry (a watery clay mixture) to form complex shapes of hollow bodies has limited applications. Gravitational influences, such as sedimentation of dispersed particles in the slurry, cause deformities. To avoid these, materials with equal densities or stabilizing additives must be used; both remedies have their limitations. Project MAUS scientists designed this experiment to demonstrate that slipcasting under microgravity is possible using a kneaded wax with dispersed particles of different density, diameter, and concentration.



German scientists designed G-027 to demonstrate the possibility of slipcasting under microgravity.

G-314

Customer: Dept. of Defense
Space Test Program;
Lt. Col. Joseph S. Kuzniar

Payload Mgr: Robert Conway
NASA Tech Mgr: Henry W. Albright
Mission: STS-51-G, June 17, 1985

Originally flown on STS-7, the Space Ultraviolet Radiation Environment (SURE) instruments once again gathered data on radiation in the upper atmosphere. SURE consisted of a spectrometer which separated the extreme ultraviolet wavelength band into two intervals of 128 discrete wavelengths. By observing and recording the radiation at distinct wavelengths, SURE obtained signatures (characteristics) of atmospheric and ionospheric atoms, molecules, and ions. These measurements provided a means of remotely sensing the ionosphere and upper atmosphere.



The Space Ultraviolet Radiation Experiment utilized a Motorized Door Assembly as seen here to expose its instruments to the upper atmosphere.

G-028

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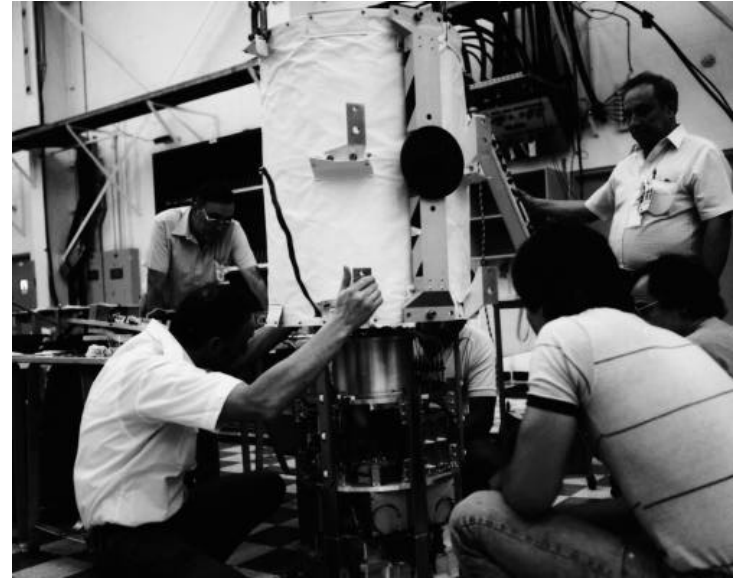
Customer: DFVLR; H. Schreiber
& H. Hebenstrick

Payload Mgr: Dieter Baum

NASA Tech Mgr: Leroy F. Shiflett

Mission: STS-51-G, June 17, 1985

By melting and resolidifying a manganese-bismuth alloy in microgravity, the German Project MAUS experimenters anticipated an increase in the yield of compound formation. Manganese-bismuth forms by a peritectic reaction, one which transforms a mixture of two different phases (in this case, manganese—a solid—and bismuth—a liquid) into a single phase compound upon cooling. On Earth this reaction is incomplete, since the components exhibit different densities and become separated by sedimentation and buoyancy. The pure compound manganese-bismuth has promising applications as an inexpensive magnetic material because of its highly coercive strength.



An inexpensive magnetic material was expected to result from this German payload.

G-471

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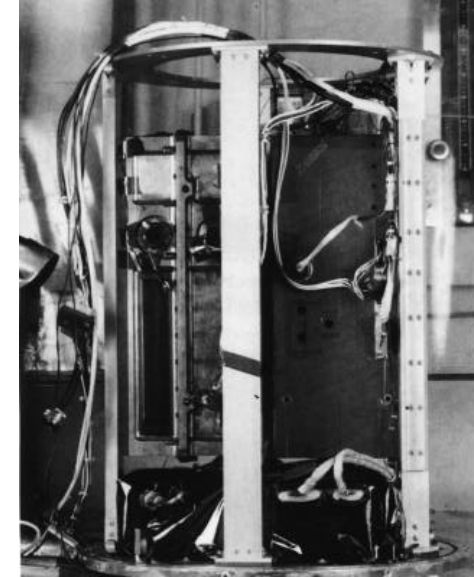
Customer: Goddard Space Flight Center;
Noel W. Hinners

Payload Mgr: Roy McIntosh

NASA Tech Mgr: Gerard Durback

Mission: STS-51-G, June 17, 1985

When Goddard Space Flight Center experimenters opened the capillary pumped loop payload after its flight on STS-51-D, they found their payload had not been turned on. Because the problem stemmed from NASA interface electronics, the payload was awarded a reflight on this mission.



The Capillary Pumped Loop Experiment demonstrated a new way to transfer waste heat away from the orbiter and into space.